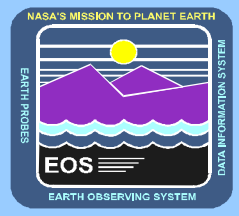
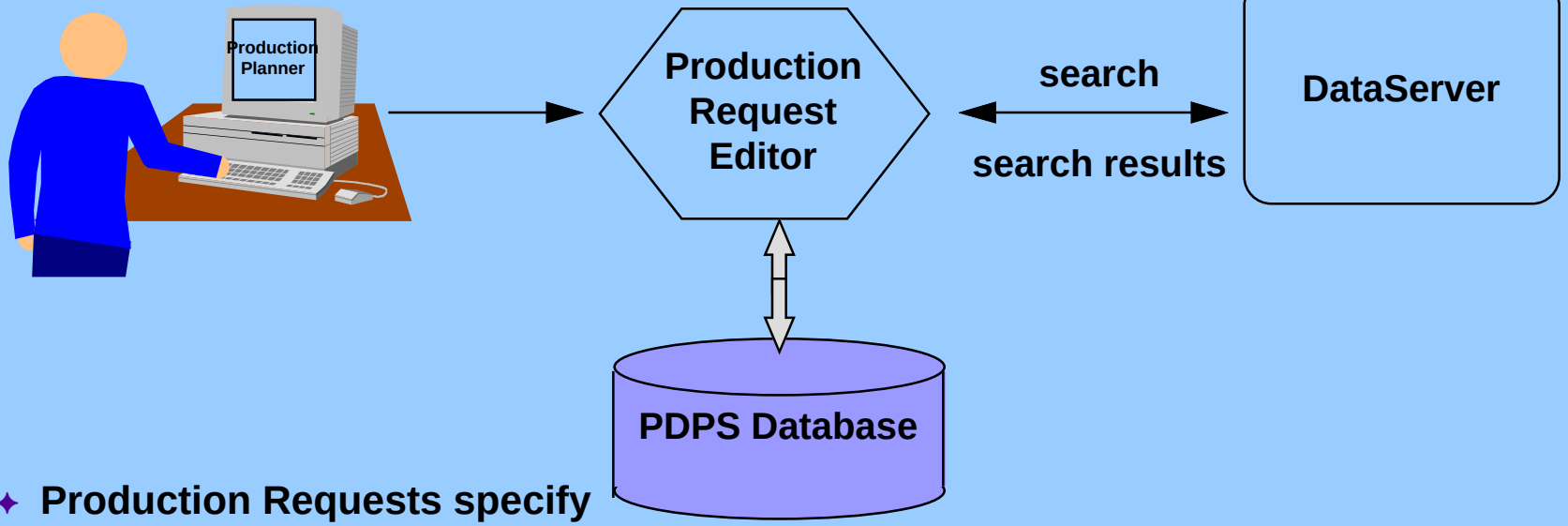


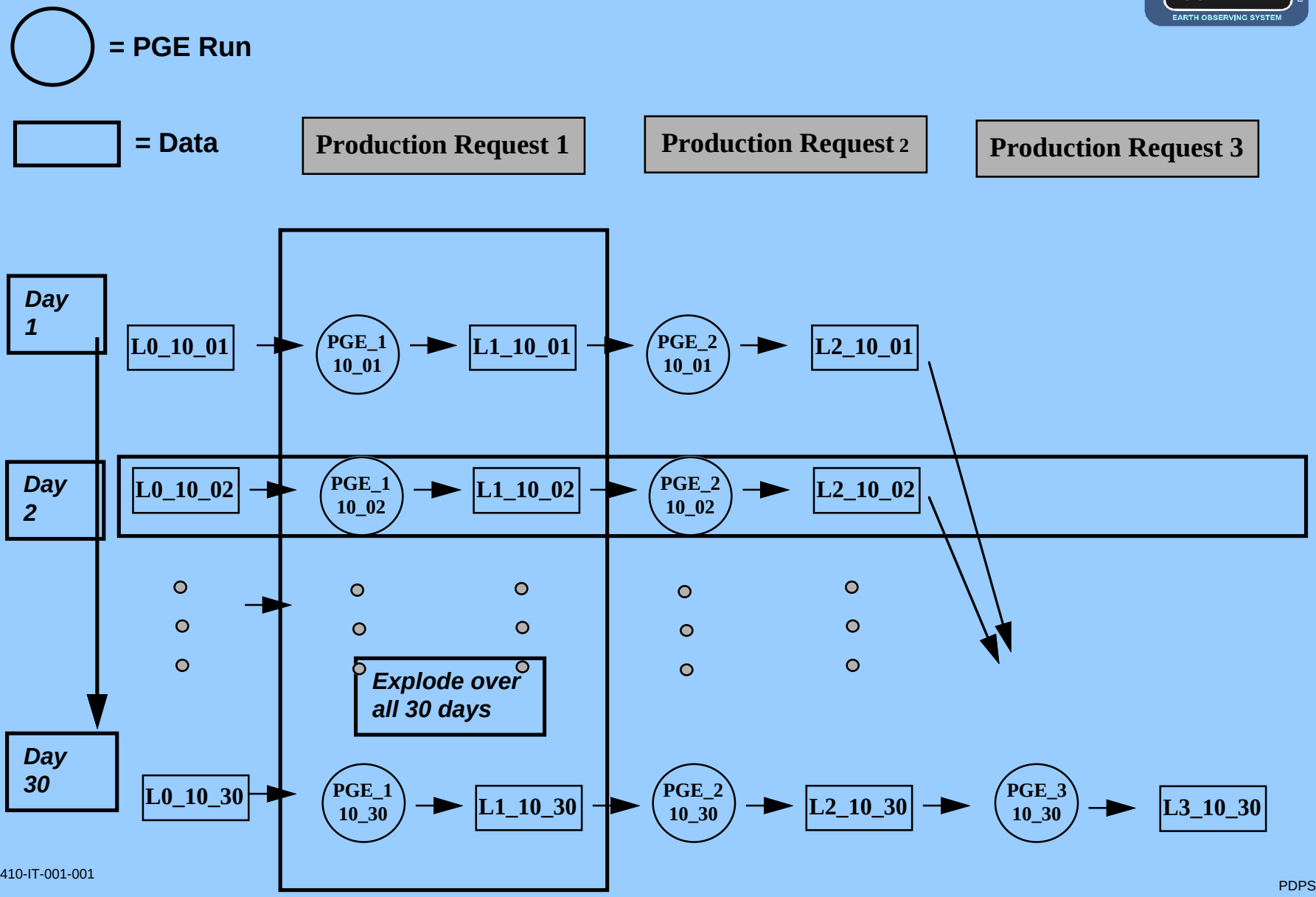
Production Planning

Entering Production Requests

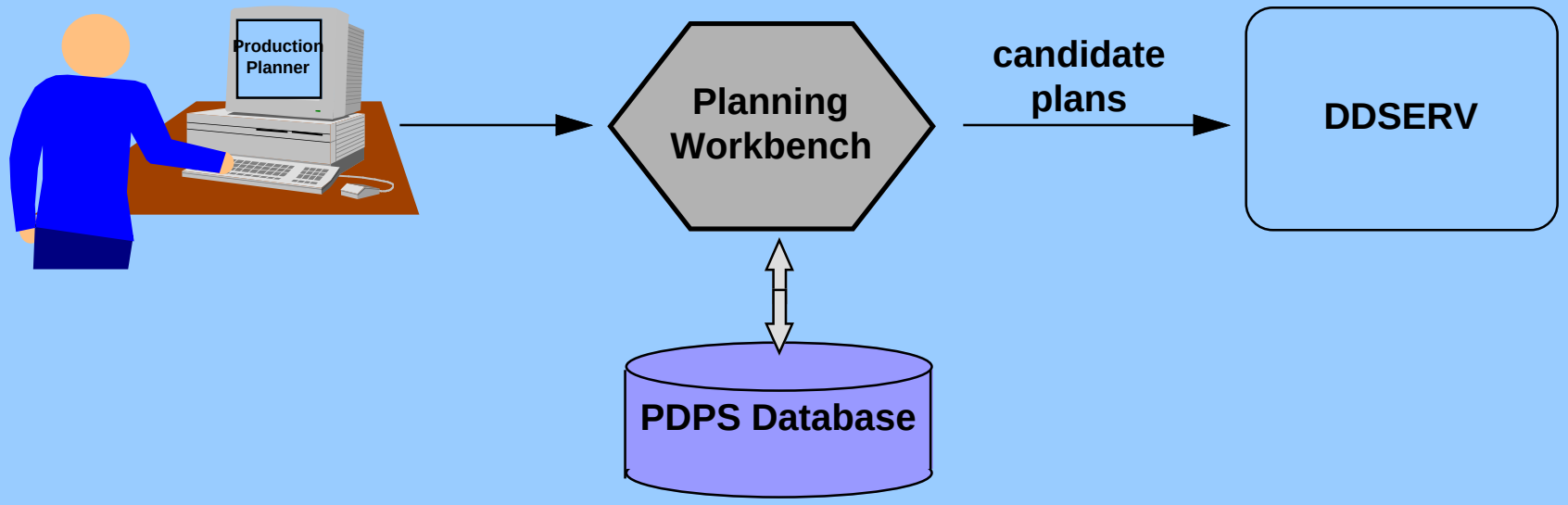


- Production Requests specify
  - routine production of data over extended periods
  - or activation of PGE over extended periods
- Production Request “exploded” into many DPRs
- Translation of “template type” profile information to “specific instance” DPR information
- Grouping of multiple requests

PLS Explosion of PRs into DPRs



Generating a Production Plan



- "What If / Candidate Planning" - based on priorities, preferences, selected PRs, predicted run times and available resources
  - Predicts execution times for data processing requests
- GUI & Report Statistics summarize plans for OPS
- Plans are available for external view via document data server

Planning Subsystem Components

Production Request Editor - Tool to enter Production Requests

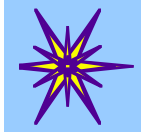
Resource Planning Workbench - Tool to schedule resources (Uses Delphi Class Libraries)

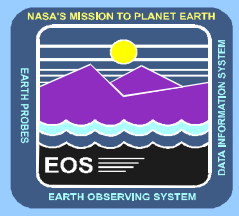
Production Planning Workbench - Tool to generate production plans (Uses Delphi Class Libraries)

Subscription Manager - Program which receives subscription notifications and acts (e.g. releases a job) based on the notifications

On-Demand Manager - Program which receives and processes on-demand production requests

PDPS Database - Stores all data used by PLS & DPS, main interface between those subsystems.





Data Processing

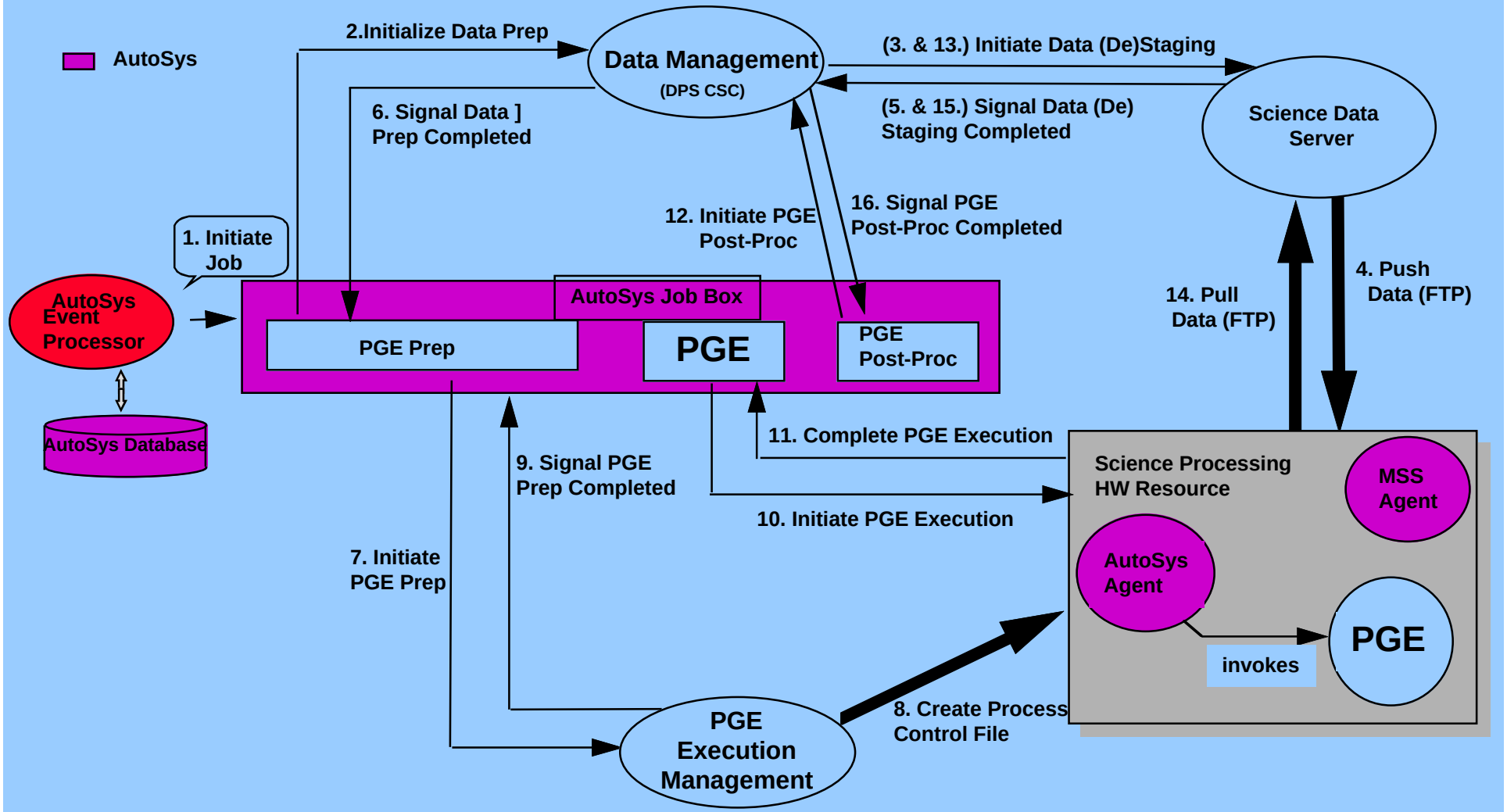
Data Processing Subsystem

The Data Processing Subsystem(DPS) actually executes the PGEs according to plans from PLS

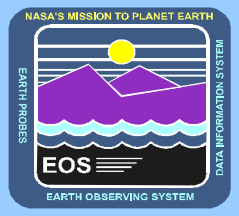
DPS

- **Acquires input data as needed from DSS**
- **Allocates memory, CPU, and disk resources to run PGE**
- **Initiates PGE execution**
- **Monitors for errors while PGE is executing**
- **Requests output product insertion by DSS**

Executing a PGE



Data Processing Subystem Components



AutoSys - COTS used run and monitor jobs on Science Processors.

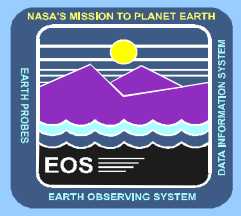
Job Management - Provides interface between DPS & AutoSys, encapsulating the COTS.

Resource Management - Manages hardware resources during production.

Data Management - Manages data staging/destaging from Data Server.

PGE Execution Management - Performs pre- and post-PGE execution services such as building the PCF and bundling log files.

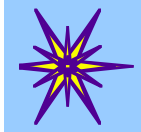
Data Processing Subystem Components (Continued)

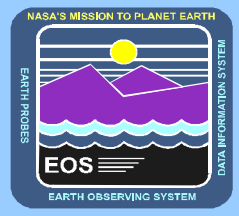


Data Pre-Processing (DPREP) - An ECS provided PGE which process satellite orbit and attitude data for use by other PGEs via toolkit calls.

Quality Assurance Monitor - Simple interface allowing DAAC operators to perform QA functions on output data.

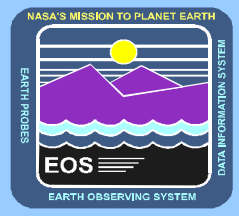
Algorithm Integration & Test Tools (AITTL) - CSCI used to perform Science Software Integration and Test (SSI&T) activities.





Special Topics

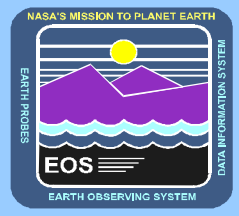
PGE Production Rules



Production Rules are the 'Recipe' for running a PGE, specifying inputs, outputs, activation conditions, etc.

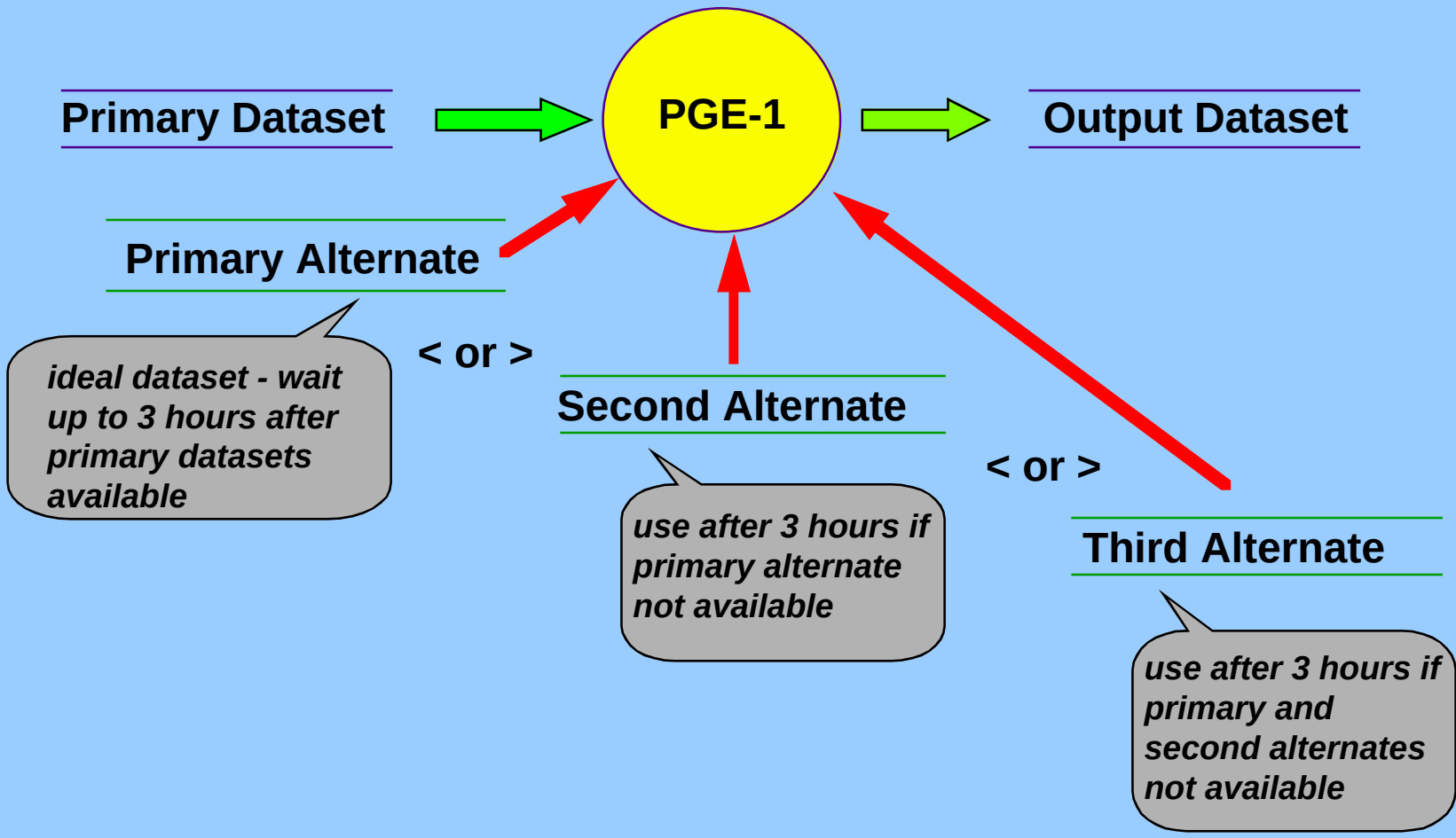
- **Rules provide a flexible processing environment**
- **Implementation of rules is spread throughout production system**
- **Rules captured during SSI&T**
- **It is possible to use multiple rules for a single PGE.**
- **Some rules can be modified when a Production Request is entered**
- **Addition of new rules will be ongoing sustaining engineering activity**

Production Rule Examples

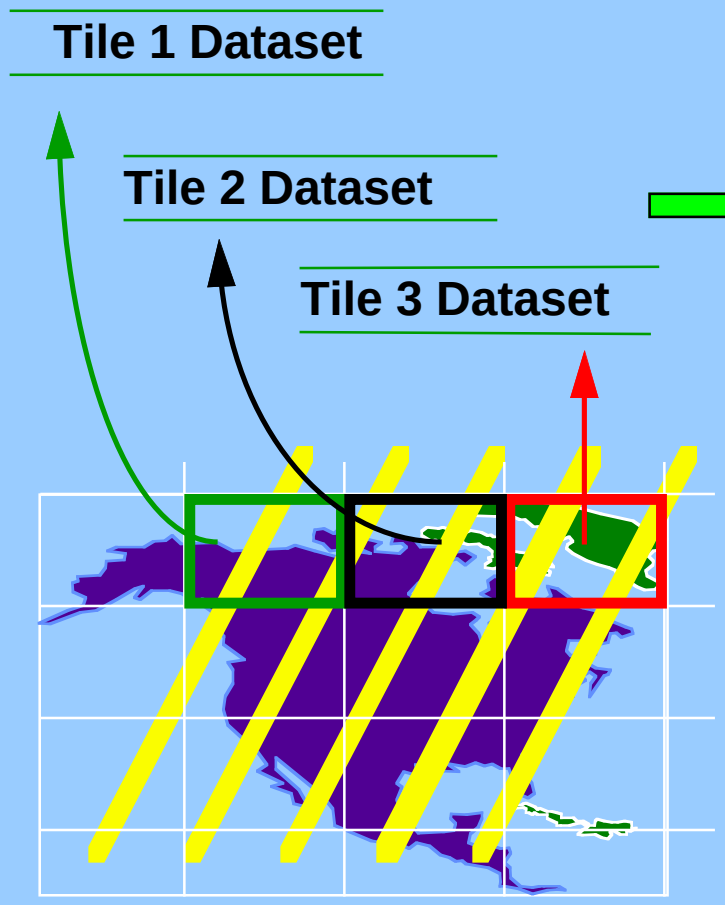


- Basic Temporal - Input times = output times
- Advanced Temporal - Input and output temporal ranges can be different
- Alternate Inputs - Choose best available data
- Optional Inputs - use input if available
- Tiling - Choose input data based on geographic area
- Intermittent Execution - execute every Nth DPR
- Metadata-based Activation - Run DPR only if metadata value meets some criteria
- Orbit-based Activation - Select input times based on orbit information

Alternate Inputs



Tiling

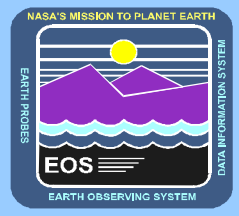


PGE-1

Output Datasets

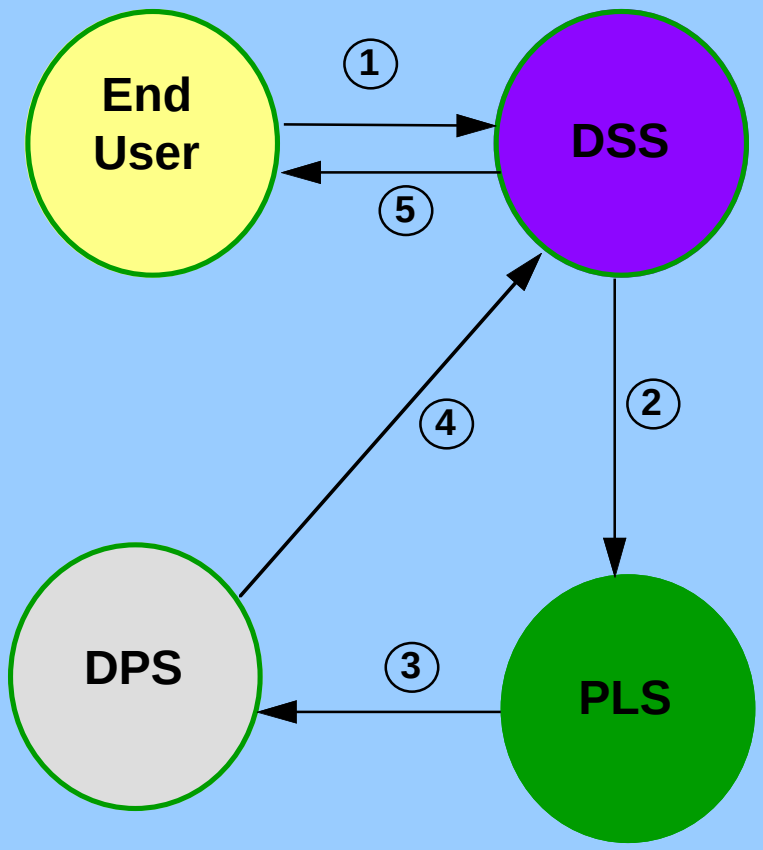
- Tile definitions (Lat/LonCoordinates) are captured and stored in PDPS database during SSI&T
- Geographic Queries made to SDSRV to select input data sets

On-Demand Processing



- **Ad-Hoc Processing initiated by an end-user (as opposed to the Production Planner.**
- **Entered from Client Subsystem Tool, passed through the DIM and the Data Server to PLS.**
- **Currently ASTER is the only instrument which will use On-Demand Processing.**

On-Demand Processing (continued)



1. On-Demand Request is entered by an end user and sent to data server.

2. Data server determines inputs are available and sends request to PLS.

3. PLS checks request against various thresholds and sends request to DPS.

4. DPS runs job and inserts results to DSS.

5. DSS notifies end user of product availability and end user acquires product.

Cross-DAAC Planning

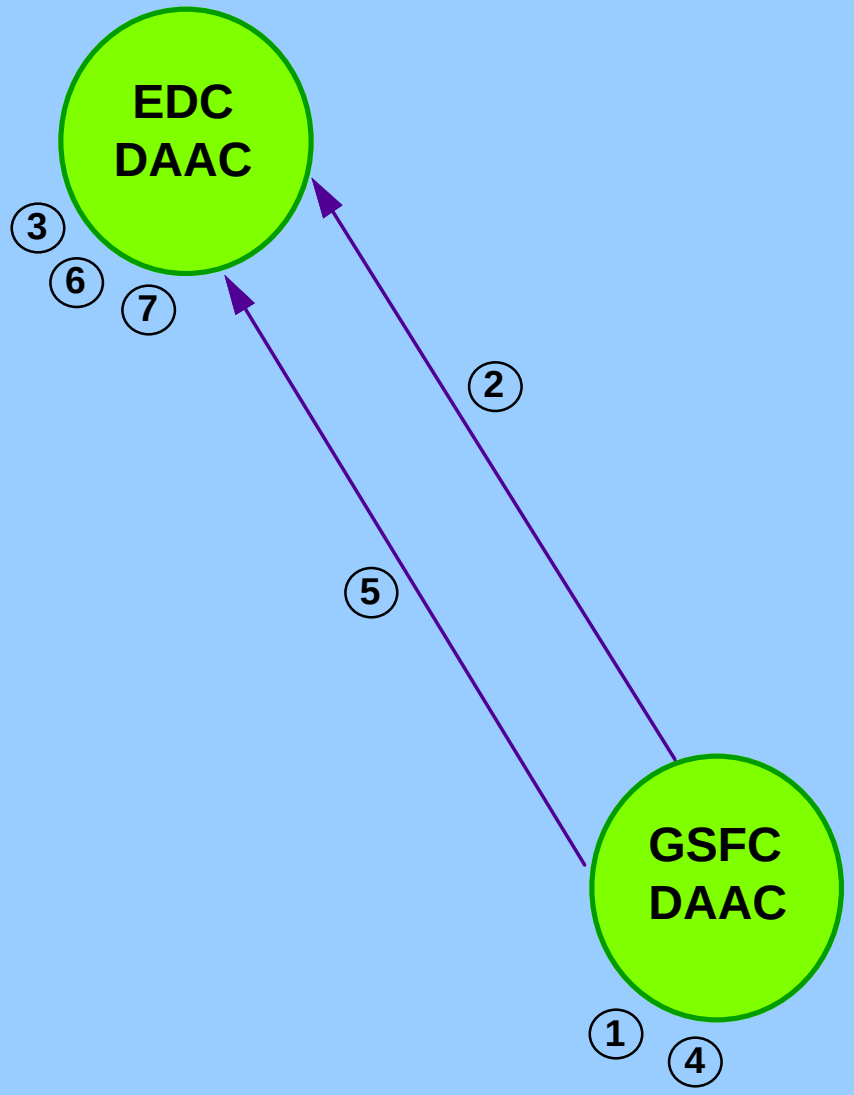
Some products produced at one DAAC require inputs being produced at another.

Predicted production time of remote input products is used in creating local production plans.

Primary mechanism for Cross-DAAC planning is the use of Predicted Data Availability Schedules (PDAS), created when a plan is created.

A DAAC's PDAS is made available to remote DAACs via Data Server.

Cross-DAAC Planning (Contintued)



1. GSFC produces production plan (and PDAS).

2. EDC (which subscribes to the GSFC PDAS) acquires GSFC PDAS.

3. Using GSFC PDAS, EDC creates its own production plan.

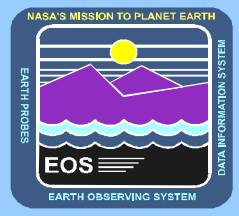
4. GSFC produces new production plan (and new PDAS) which changes predicted availability times for data used at EDC.

5. EDC subscription automatically gets new PDAS

6. New PDAS is automatically evaluated (against configurable criteria) and decision is made about whether to prompt operator to replan.

7. New GSFC PDAS used in all subsequent EDC production plans.

Summary



- PGEs are the science software which processes satellite data. They are developed by instrument teams
- PGEs are entered in ECS through SSI&T
- The Planning Subsystem provides candidate production plans for DAAC operators based on PGE and data availability information
- The Data Processing Subsystem executes PGEs to create new products